

PART F INCIDENTAL CONSTRUCTION

FIELD LABORATORY

600

600.1 DESCRIPTION

This work consists of furnishing, placing and maintaining field laboratories.

600.2 MATERIALS

Field laboratories shall be Type I, Type II, or Type III as specified. All field laboratories shall conform to the following general requirements and to the specific requirements for each laboratory type, which are defined below. The Engineer may permit minor deviations provided they do not impair the usefulness of the laboratory.

Type I and Type II field laboratories put into service prior to January 1, 2004 that conform to the specification requirements outlined in the 1998 edition of the South Dakota Standard Specifications for Roads and Bridges will be allowed for use until January 1, 2008 provided they are furnished with the requirements specified in Section 600.2.A - Items 9,10,12,17, and 18 of this edition of the South Dakota Standard Specifications for Roads and Bridges.

A. General Requirements: The field laboratory shall consist of a weather proof and thermal resistant structure, which has been modified or originally constructed to meet these specifications.

The field laboratory shall be neat, clean, in good repair, and shall be placed at a location satisfactory to the Engineer. The field laboratory shall be adequately anchored to the ground, leveled, and rigidly supported to eliminate floor and workbench vibrations to allow for accurate weighing on a bench supported scale.

A set of steps and hand railings shall be provided at each of the exterior doors. If the floor of the laboratory is 18 inches (450 mm) or more above the ground, a landing shall be constructed at all exterior doors. The minimum dimensions for the landing shall be 4 feet by 5 feet (1200 mm by 1500 mm). The top of the landing shall be level with the threshold of the doorway.

The Contractor shall furnish continuous electrical power and fuel supply for the heating and cooling systems, range, and lighting. The electrical system shall include one exterior wall outlet with protective cover and one fuse or circuit breaker box. Each laboratory shall have an outside power disconnect.

Each laboratory shall contain at least one opening type clear glass windows with screens in each sidewall of each room and one in each exterior end wall to provide equal and adequate light and ventilation for each room. If a door is located on the end wall of the lab, a window is not required on that wall. There shall be one exterior door in each room, except for the office room, one of which shall be at least 36 inches (900 mm) wide. Exterior doors and windows shall be provided with locks. The Contractor shall furnish the Engineer with keys for the doors.

The Lab is considered as a No Smoking Facility. The Contractor is responsible to post signs on each lab door stating that no smoking is allowed inside the lab.

Each laboratory shall contain the following equipment:

1. A heating and cooling system capable of maintaining $75^{\circ}\text{ F} \pm 5^{\circ}\text{ F}$ ($24^{\circ}\text{ C} \pm 3^{\circ}\text{ C}$) in the Testing Rooms and Office Room.
2. A pressure water system or gravity fed water system with at least a 100-gallon (375 Liter) capacity capable of maintaining a minimum pressure at the faucet of 5 psi (0.35 kg/cm).
3. A sink and faucet with a hose bib connector. The faucet shall be a minimum of 12 inches (305 mm) above the sink. The sink shall drain to the exterior of the lab. The sink shall be located in Testing Room II for the Type I & Type III laboratories and in Testing Room I for the Type II laboratory.
4. Artificial lighting system with fixtures providing adequate illumination over all work areas and each desk.
5. There shall be a minimum of two four-gang outlets per each sidewall, per each room. There shall be a minimum of one four-gang outlet per each exterior end wall of each room. There shall be one four-gang outlet under each desk area. All electrical outlets shall be ground fault protected.
6. One storage closet 24 inches (610 mm) deep and 7.0 feet (2.1 meters) high with a minimum door width of 24 inches (610 mm). The cabinet shall include shelves and garment storage space.
7. An exhaust fan capable of circulating and exhausting the air in rooms containing range/oven and sieve equipment.
8. One 30-inch (760 mm) electric range with four burners and a thermostatically controlled oven in Testing Room I for the Type I and II Laboratories and Testing Room II for the Type III Laboratory.
9. A one cubic foot (0.03 cubic meters) 1000-watt microwave oven in Testing Room II.
10. An activated hard-wired touch-tone telephone with integrated answering machine and plain paper fax/copier machine in Testing Room II for the Type I and II Laboratories and Office Room for the Type III Laboratory.
11. One fire extinguisher rated 10 A-B-C mounted in a prominent location.
12. A 15 unit first aid and eyewash kit. The kits shall be mounted in a readily available location.
13. Broom, dustpan, garbage can and garbage bags.
14. Two chairs and two stools.
15. A portable sanitary facility shall be set up adjacent to the field laboratory.

16. On projects requiring concrete test specimens, a metal or polyethylene tank 7.0 feet (2.1 meters) long, 29 inches (735 mm) wide and two feet (610 mm) deep shall be installed beneath the worktable. The surface of the worktable above the tank shall be hinged to allow the tabletop and support to be lifted out of the way to provide access to the tank. A gate valve shall be installed to drain the tank. When heating is required, the tank shall be equipped with a thermostatically controlled water heater to maintain the water temperature between 70° F and 76° F (21° C and 24° C).
17. If the laboratory is to be used as a QA Laboratory, the Contractor shall furnish a Portland cement concrete pad for a base to operate the Marshall compactor inside the laboratory immediately adjacent to the exterior door.
18. If the laboratory is to be used as a QA Laboratory, the Contractor shall furnish two mechanical convection ovens in the laboratory in addition to the oven required. The ovens shall have a minimum chamber volume of 5.0 cubic feet (0.14 cubic meter) and be equipped with thermometer readout through the top. The ovens shall be capable of heating to a temperature of 350° F (177° C). The oven shall have a thermostatic controller and be able to maintain a uniform material temperature $\pm 5^{\circ}$ F (3° C).

B. TYPE I FIELD LABORATORY:

1. **Size:** The floor area based on exterior dimensions shall not be less than 200 square feet (18.5 square meters). The exterior width shall be a minimum of 8 feet (2.4 meters) and maximum of 10 feet (3.0 meters). The interior floor to ceiling height shall not be less than 7.0 feet (2.1 meters) high. The laboratory shall be floored and shall have a transverse center partition with a 32 inch (800 mm) width door. The partition shall divide the laboratory into two sections with approximately equal floor space.
2. **Testing Room I:** The testing room shall contain the following:
 - a. One movable worktable 30 inches (730 mm) high with surface dimensions of 24 inches by 48 inches (600 mm by 1200 mm).
 - b. One movable worktable 36 inches (900 mm) high with surface dimensions of 24 inches by 48 inches (600 mm by 1200 mm).
 - c. A minimum of 16 feet (5 meters) of open shelving not less than 12 inches (300 mm) wide mounted at convenient locations.
3. **Testing Room II:** The testing room shall contain the following:
 - a. One worktable 36 inches (900 mm) high, 10 feet (2.5 meters) long and 36 inches (900 mm) wide shall be attached to the wall opposite the exterior door with one end adjacent to the exterior end wall.
 - b. One movable desk with one center drawer and file drawers.

- c. A minimum of 16 feet (5 meters) of open shelving not less than 12 inches (300 mm) wide mounted at convenient locations.

C. TYPE II FIELD LABORATORY

1. **Size:** The floor area based on exterior dimensions shall not be less than 280 square feet (26 square meters). The exterior width shall be a minimum of 8 feet (2.4 meters) and a maximum of 10 feet (3.0 meters). The interior floor to ceiling height shall not be less than 7.0 feet (2.1 meters) high. The laboratory shall be floored and shall have a transverse center partition with a 32-inch (800 mm) width door. The partition shall divide the laboratory into two sections with approximately equal floor space.
2. **Testing Room I:** The testing room shall contain the following:
 - a. One worktable 36 inches (900 mm) high, 10 feet (3.0 meters) long and 36 inches (900 mm) wide shall be attached to the wall opposite the exterior door with one end adjacent to the partition wall.
 - b. One movable worktable 30 inches (760 mm) high with surface dimensions of 24 inches by 48 inches (600 mm by 1200 mm).
 - c. One movable worktable 36 inches (900 mm) high with surface dimensions of 24 inches by 48 inches (600 mm by 1200 mm).
 - d. A minimum of 16 foot (5 meters) of open shelving not less than 12 inches (300 mm) wide mounted at convenient locations.
3. **Testing Room II:** The testing room shall contain the following:
 - a. One worktable 36 inches (900 mm) high, full length of the room and 36 inches (900 mm) wide shall be attached to the wall opposite the exterior door.
 - b. Cupboard(s) one 32 inches (800 mm) long, 12 inches (300 mm) deep and 24 inches (600 mm) high. The cupboard(s) shall be a minimum of 18 inches (450 mm) above the top of the worktable.
 - c. A minimum of 16 foot (5 meters) of open shelving not less than 12 inches (300 mm) wide mounted at convenient locations.
 - d. Two movable desks with one center drawer and file drawers.

D. TYPE III FIELD LABORATORY

1. **Size:** The floor area based on exterior dimensions shall not be less than 360 square feet (33 square meters). The exterior width shall be a minimum of 8 feet (2.5 meters) and a maximum

of 10 feet (3.0 meters). The interior floor to ceiling height shall not be less than 7.0 feet (2.1 meters) high. The laboratory shall be floored. The lab will be separated into three rooms. The Office Room shall have approximately 80 square feet (7.0 square meters), Testing Room I shall have approximately 120 square feet (11.0 square meters) and Testing Room II shall have approximately 160 square feet (15.0 square meters). The transverse partitions shall have a 32-inch (800 mm) width door.

2. Testing Room I: Testing Room I shall contain the following:

- a. One worktable 36 inches (900 mm) high, 10 foot (3.0 meters) long, and 36 inches (900 mm) wide shall be attached to the wall opposite the exterior door with one end adjacent to the partition wall.
- b. One worktable 30 inches (760 mm) high with surface dimensions of 30 inches (760 mm) by 8 feet (2.5 meters).
- c. Cupboard(s) one 32 inches (800 mm) long, 12 inches (300 mm) deep and 24 inches (600 mm) high. The cupboard(s) shall be a minimum of 18 inches (450 mm) above the top of the worktable.
- d. A minimum of 16 feet (5 meters) of open shelving not less than 12 inches (300 mm) wide mounted at convenient locations.

3. Testing Room II: Testing room II shall have the following:

- a. One worktable 36 inches high, 8 feet (2.5 meters) long and 30 inches (760 mm) wide.
- b. One worktable 36 inches (900 mm) high with surface dimensions of 24 inches (600 mm) long by 36 inches (900 mm) wide, with one shelf 18 inches (450 mm) above the table. Place the stove (oven with cooktop) adjacent to this worktable, and a fixed worktable 36 inches high with surface dimension 10 feet (3.0 meters) long and 36 inches (900 mm) wide.
- c. Cupboard(s) one 32 inches (800 mm) long, 12 inches (300 mm) deep and 24 inches (600 mm) high. The cupboard(s) shall be a minimum of 18 inches (450 mm) above the top of the worktable.
- d. A minimum of 16 feet (5 meters) of open shelving not less than 12 inches (300 mm) wide mounted at convenient locations.

4. Office Room: The office room shall contain the following:

- a. A solid mounted desk in an L-shaped pattern, 30 inches (760 mm) wide. Two seating areas, each with a center drawer and file drawers. The seating areas shall be situated such that both workspaces can be occupied at the same time.

- b. Cupboard(s), one 32 inches (800 mm) long, 12 inches (300 mm) deep, and 24 inches (600 mm) high. The cupboard(s) shall be a minimum of 18 inches above the top of the worktable.

600.3 CONSTRUCTION REQUIREMENTS

The laboratory shall be for the exclusive use of the Engineer. The location of the laboratory will be as directed by the Engineer and shall be relocated by the Contractor as required by the Engineer. The laboratory will be required to be furnished when requested by the Engineer. On QC/QA projects the Engineer may allow a Type I lab to be supplied until such time the Engineer determines the Type III lab is required. If the Engineer allows a temporary Type I lab to be furnished, no additional payment for that lab will be made. The laboratory shall not be removed from the project until released by the Engineer.

600.4 METHOD OF MEASUREMENT

Field laboratories will be measured on a per each basis.

600.5 BASIS OF PAYMENT

The accepted quantity of field laboratories will be paid for at the contract unit price per each. The contract unit price will be full compensation for furnishing the laboratory and specified equipment and for necessary services until the building is released by the Engineer.

The field laboratory will remain the property of the Contractor.

The item of Field Laboratory will not be subject to unit price negotiation regardless of any underrun or overrun of the contract quantity, nor will the provisions of Section 9.6, relative to reimbursement, apply in the event the entire item is eliminated.

This item will not be subject to the provisions of Section 8.1.

Upon placement of an acceptable field laboratory on the project, 75 percent of the contract unit price will be paid. Upon release by the Engineer, the remaining 25 percent of the contract unit price will be paid.